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Population Mobility and Trypanosomiasis in Africa*

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Population mobility has long been established as a feature of life in Africa south of the Sahara. Even though it appears to be a factor in the spread of sleeping-sickness there do not seem to have been serious epidemics until the latter part of the nineteenth century and the early decades of the twentieth century. Various types of population movement of the present day and their possible relevance to trypanosomiasis are discussed. Density of population and settlement patterns are also important. Some of the changes in these which are relevant to trypanosomiasis are outlined and the need for more detailed information on these and on population mobility is emphasized.

POPULATION MOVEMENTS IN THE PAST

A recent review of trypanosomiasis in Africa (Nash, 1960) suggests that epidemics of sleeping-sickness in the past were possibly on a smaller scale than those which were experienced in some parts of the continent during the first three decades of the present century. It is assumed that less population mobility, as compared with more recent times, was one of the factors in this situation.

"... in the days of endless tribal warfare there was little travel and the population tended to concentrate for safety in large communities, whose extensive farm clearings must have produced tsetse-free zones around the settlements."

In the savannah zone of West Africa the population was less dispersed in the past than at the present day, but to suggest that it was immobile, or very much less mobile than at the present day, is a dubious generalization. Any generalization is dangerous for tropical Africa with its great physical and human diversity [2] and furthermore there are difficulties in elucidating clearly what happened in the past. Certainly there were various forms of mobility among the people of tropical Africa before the beginning of the present century and though movements and the factors determining them were in some instances the same as those at the present day, there were also important differences. For example:

Pastoralists with their herds and flocks have been obliged to follow patterns of seasonal movement in search of pasture and water from time immemorial, and they continue to do so.

Holy places have caused *pilgrims* to travel long distances, particularly in the pilgrimages from West Africa to Mecca which have continued since the conversions to Islam from the eleventh century onwards.

Widespread trade contacts have existed for many centuries, though they probably involved only comparatively few people.

With possible exceptions in some areas, pastoralism, pilgrimage and trade probably contributed little to mobility in the past compared with the *movements of whole tribes*. Fulani-speaking people, who are now distributed throughout the northern parts of West Africa from Senegal to Adamawa, originated somewhere to the north-east of the Sahara desert. Over a period of several centuries they moved many thousands of miles, generally in a south-westerly direction to the Fouta Toro area south of the Senegal river. After the ninth century A.D. they dispersed from there southwards and eastwards to occupy eventually the areas in which they are found at the present day. This form of long-term migration in addition to seasonal movements takes place at the present time among some Fulani groups (Stenning, 1959). It has been seen on a much larger scale in north-east Africa in the progressive southward movements of Somali pastoralists, which were halted only by strict administrative measures along the line of the Tana river in northern Kenya earlier in the present century. Probably on a much larger scale

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[2] Prothero, R. M. (1961). Unpublished working document WHO/Mal/315.

than either the Somali or the Fulani movements were those associated with the expansion of Bantu-speaking peoples. Only some details of these movements are known but the outermost wave of this expansion was still in progress in the early decades of the nineteenth century and came into contact and conflict with European pioneers in South Africa.

Warfare and devastation, often associated with slave-raiding and slave-trading, were both the cause and the result of population movements. The general pattern of tribal movements seems to have been one in which more warlike tribes displaced their weaker neighbours, forcing them to move elsewhere and thereby often starting waves of movement in which successive groups of people were involved. Weaker peoples were enslaved either to satisfy indigenous social and economic needs or to be sold through middlemen to Europeans on the west coast or to Arabs in East Africa. The numbers that were affected by slaving were very great and large areas of tropical Africa were severely depleted of their inhabitants, if not wholly depopulated. Even if people were not carried off into slavery, the devastation caused by warfare and the wholesale disruption of life (which is simple to achieve when life is closely controlled by the seasons as in tropical Africa) was sufficient to result in famine with deaths directly from undernutrition or from disease aggravated by malnutrition. Migration and depopulation were common under these conditions. All movements were not generated by warlike conditions and the peaceful penetration of one tribe's lands by people from another group sometimes took place. The increased numbers of people were then likely to exert pressure on resources which might lead in time either to a catastrophic famine and then to movement, or else to movement to alleviate the pressure before a catastrophe occurred.

Bearing in mind all these types of movement, it is impossible to contend that there was little population mobility in tropical Africa before the present century.

MODERN STABILITY AND MOBILITY

The establishment of colonial administrations in Africa, mainly in the early years of the present century, had fundamental effects on population and on its mobility.[1] They created stability of a kind which had been lacking previously; tribal warfare was brought to an end, slave-raiding and trading ceased, devastation no longer took place and the likelihood of famines was very much reduced. Nowadays, even when harvests fail because of unfavourable weather, food can be brought from other areas (and even from other continents) to avoid serious shortages; malnutrition remains a major problem in Africa but undernutrition has in many areas virtually disappeared. Some of the causes of traditional movements of population were thus eradicated and a previously fluid situation became relatively static. The areas occupied by tribal groups, which at the time may have been in the process of either expansion or contraction, became fixed and could not be changed as in the past.

But at the same time as this general degree of stability was being established there were other factors coming into operation which were to be responsible for the development of new forms of population mobility. The peace and security that came with European administration made travel for economic and social reasons much easier and safer than it had been previously. To make administration more effective and to promote economic development, old forms of communications were improved and new ones developed. Railways were built inland from the coast, road systems were laid out and river transport was improved wherever possible. Economic developments, which for the most part were directly or indirectly inspired, financed and organized by Europeans, were designed to bring tropical Africa into the mainstream of the world economy. During the present century the production of traditional crops has been increased to meet demands for their export, new crops have been introduced, minerals have been exploited and industries have been established. In some parts of tropical Africa Europeans have taken up land and have established farms and plantations which differ fundamentally in size and in organization from African farm holdings. All of these radical economic changes have contributed to the development of migrant labour, a new and vitally important form of population mobility.

MIGRANT LABOUR MOVEMENTS

It has been estimated that at least five million people are involved in migrant labour movements

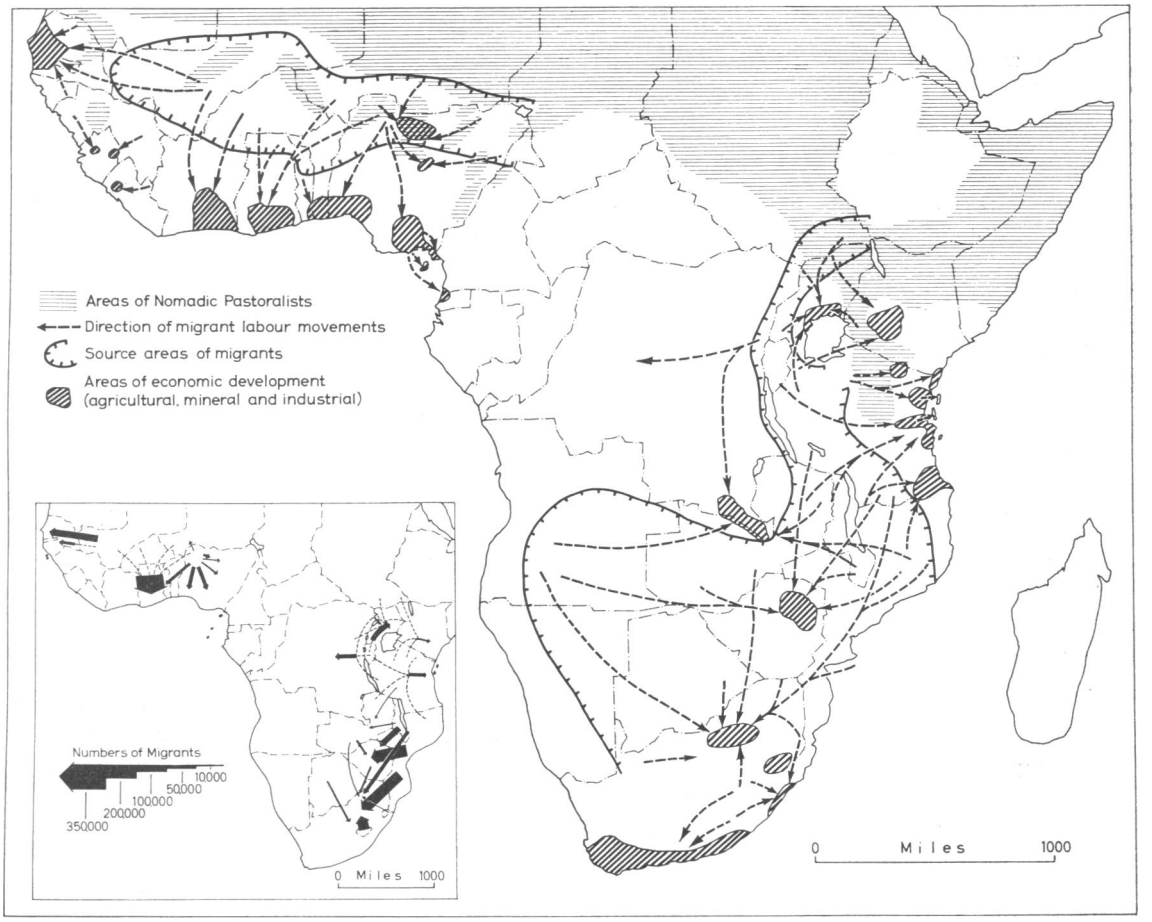
[1] It is believed that widespread disease and high rates of incidence were responsible for preventing significant increases in population in Africa before the beginning of the present century, and that the increases that have taken place in recent decades are due in part to the introduction of public health measures that may be far from adequate but have been sufficient nevertheless to have influenced the demographic situation.

each year in Africa south of the Sahara. They are influenced by a desire to enjoy the relatively higher standards of living which can be obtained by contributing their labour to, and by acquiring skills in, the economic developments mentioned above. This desire is the major factor which draws them to areas of export cash-crop production, to plantations, to mines and factories, to commercial centres and to seaports. There are other important economic factors which operate in the areas from which the migrants originate, for many come from parts of the continent where there is pressure of population on resources and often serious shortage of land. Under these conditions people may be forced to migrate. Social, psychological and political factors also influence the development of migrant labour, but the economic factors are by far the most important.

It is possible to indicate only the general pattern of migrant labour movements for Africa south of the Sahara and Fig. 1 gives a diagrammatic and not an actual representation of what takes place. If these movements are relevant in the epidemiology of sleeping-sickness—in their relationship to areas infested with tsetse-fly, or as regards arranging for the treatment of sleeping-sickness and planning for and establishing areas which would be free of the disease—it would be necessary to consider

FIG. 1

MAJOR MOVEMENTS OF MIGRANT LABOUR AND MAIN AREAS INHABITED BY NOMADIC PASTORALISTS IN AFRICA SOUTH OF THE SAHARA



On the inset map numbers of migrants are shown where this information is available.

studying them in much greater detail. The routes along which and the means by which people travel to and from work are aspects of the study of migrant labour which have been badly neglected; and, while more detailed patterns of movements are known for some areas, there are many parts of tropical Africa for which very little is known.

The movements of migrant labour may be divided into two major groups—those in West Africa and those in East, Central and South Africa (Fig. 1). This division is valid not only on the basis of geographical location but also in respect of other differences that may be recognized.

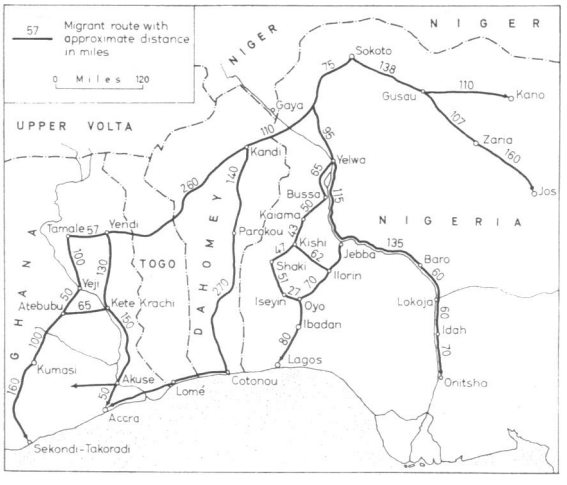
West Africa

Movements are generally along a north-south axis: for the most part from northern areas where the physical environment is marginal for successful agricultural development (e.g., Upper Volta, Niger, northern Ghana and Northern Nigeria—Prothero, 1962) to areas of relatively advanced economic development further south (e.g., groundnut-growing areas in Senegal and Northern Nigeria, cocoa-growing areas in Ghana, Ivory Coast and Western Nigeria, the ports and major towns such as Dakar, Abidjan, Accra and Lagos). Migrants cover long distances on their journeys to and from work and some indication of these is given for migrant labourers from Sokoto Province, Northern Nigeria, in Fig. 2, although even the greater detail of routes shown here does not provide any real indication of their actual complexity. It is known that the Sokoto migrant labourers are a factor in the spread and maintenance of smallpox and malaria (Prothero, 1961a), but any significance they may have in the epidemiology of sleeping-sickness has not been established.[1] Throughout West Africa migrant labour movements possess certain common characteristics, some of which may be of importance in epidemiological studies (Prothero, 1959):

They are mainly seasonal in nature. Migrants leave their home areas after the harvest has been gathered (late September/October/early November)

FIG. 2

MIGRANT LABOUR ROUTES FROM SOKOTO PROVINCE, NORTHERN NIGERIA



and remain away until just before the onset of the next wet season (April/May), when they return to cultivate their farms.

The majority of migrants who travel long distances are either unmarried men, or men who go without their wives and children, whom they are leaving behind for only limited periods of time.

Until recent times the greater part of the migrants' journeys were made on foot but important developments in communications, particularly by road, since the Second World War have tended to change this. Some migrants, however, still make some parts of their journeys on foot, either from choice or because there is no alternative. It would seem that journeys on foot are likely to provide circumstances more favourable for contracting and spreading sleeping-sickness than would journeys by road or rail. The slower rate of movement would result in more frequent and direct contact between migrants and tsetse flies at stream-crossings and at drinking-places *en route*. The particular sections of migrant labour routes that are usually traversed on foot are not known. In the past these long journeys must have involved great hardship and many that are made at the present time must be far from easy.

East, Central and South Africa

The main lines of movement are shown in Fig. 1. Here, as in West Africa, movements are from areas of restricted and retarded economic development and/or population pressure on the land to areas of

[1] Duggan in discussion (Waddy, 1962) states, " A movement of at least 125,000 people takes place to and from the north-western Nigerian province of Sokoto each year, yet it has not been possible to associate this migration with sleeping-sickness transmission within Nigeria itself. It is more than likely, however, that it is important in the spread of purely contagious diseases such as cerebrospinal meningitis, smallpox and possibly tuberculosis ". Scott (1957) discusses in detail the significance of population movements, particularly of migrant labour, for the epidemiology of human trypanosomiasis in Ashanti.

more precocious development; but there are also important contrasts with West Africa which may be of significance in epidemiology:

Many of the migrants remain away from their home areas for longer periods of time and their movements to and from work are not so closely related to a seasonal pattern as in West Africa. There is movement taking place at all times,whereas in West Africa the majority of migrant labourers are moving during fairly limited periods of the year. There are, of course, some movements which are seasonal, as, for example, those of labourers from the East African mainland to the islands of Zanzibar and Pemba for the clove harvest.

Absence from home for longer periods is related to the fact that many of the enterprises on which migrants are employed (plantations, mines, factories) are European-owned and organized and are on a larger scale than those which employ migrants in West Africa. In these, migrant labourers take up employment on contract for specified periods, usually between 12 months' and two years' duration.

Often, though by no means always, migrant labourers engaged on contract are recruited in their home areas, medically examined and then transported, or assisted in transport, to their places of work. As a result the movement of migrants is relatively more controlled, and the routes along which they travel are better known than in West Africa. But in Tanganyika, for example, the sisal industry, which is the single biggest employer of migrant labour, receives only about 30% of its force through its recruiting organization. Further south the movements of migrant labour are more strictly controlled, until in the Republic of South Africa, where more migrant labour is employed than anywhere else in the continent, it is illegal for any migrant labour to enter other than under contract through one of the recruiting organizations. Such rules do not, of course, prevent entirely the entry and exit of people without contracts.

As in West Africa, migrant workers who are away from home for not more than two years are generally without their wives and families.

Migrant labour movements are essentially a twentieth-century element of African population mobility. They have continued to increase with new economic developments and are likely to continue in this way for the foreseeable future, even though migrant labour is considered unsatisfactory from many social and economic points of view. Account must be taken of them in any public health problem in which population mobility may be an influencing factor. They can be satisfactorily considered only from an international point of view, for there is no country in Africa south of the Sahara in which these movements of population are contained within its national boundaries. At the present time they cross and re-cross international boundaries with very little control being exercised over them.

No study has been made of migrant labourers *en route* to and from places of work. It would be valuable to know something of the physical condition of migrants and of the health risks to which they are exposed and to which they expose those with whom they come into contact during their travels. Such a study would yield data of importance not only for the epidemiological studies of diseases such as sleeping-sickness and malaria but also for the problems of international quarantine and health control on frontiers.[1]

OTHER POPULATION MOVEMENTS

Some consideration must be given to the present-day features of three types of movement which have existed in Africa for many centuries and to which reference has already been made. These may also have features which are relevant to the epidemiology of sleeping-sickness.

Pilgrim movements

These probably have little relevance, for the main pilgrimages begin in, and certainly take place through, parts of Africa which are tsetse-free. Muslim pilgrims from the northern parts of West Africa, which are mainly tsetse-free, travel by way of the Republics of Niger and Chad, which are tsetse-free, to the Republic of Sudan and then across the Red Sea to Mecca. The parts of the Republic of the Sudan through which they pass lie well to the north of the tsetse-infested areas of that country.

Nomadic pastoral movements

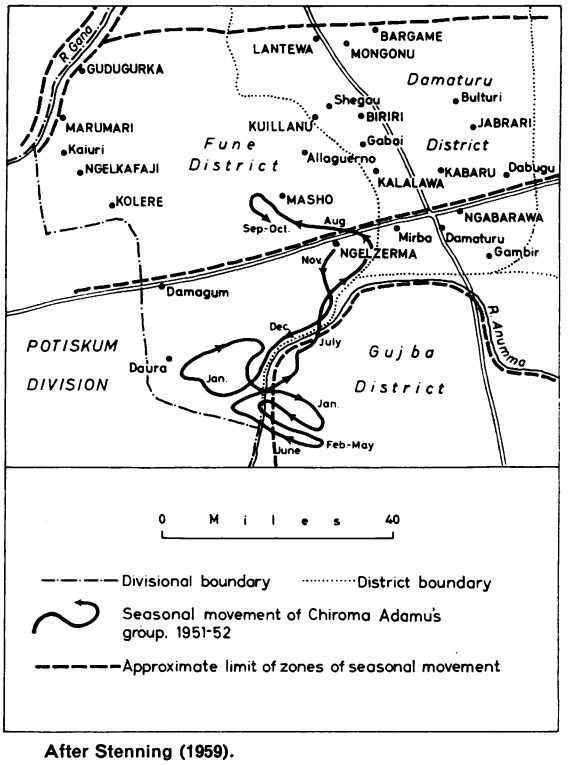
These may be important both for the people in respect of sleeping-sickness and for their cattle in respect of *nagana*, though many of the main areas of nomadic pastoralism are in latitudes where the climate and the vegetation are unfavourable for

[1] Duggan (*op. cit.*) states that in respect of disease " . . . the significance of interterritorial migration is still not fully understood. There is no doubt that migration is significant but there is little information available to measure its significance ".

tsetse-fly breeding. This is particularly true of large areas of north-eastern Africa where the majority of the population are nomadic pastoralists (e.g., northern Kenya, parts of Ethiopia, Somalia and parts of eastern and northern Sudan). In West Africa many of the areas over which the Fulani nomads wander are tsetse-free but at times people with their stock may be forced to move southwards into areas which are infested. To find adequate pasture and water in the dry season, some Fulani groups in Northern Nigeria move southwards into the valleys of the Niger and Benue rivers and their main tributaries, and they then come into country where tsetse-fly infestation is widespread during the wet season but is more concentrated during the dry months. The risks of man-fly and animal-fly contacts are high since both men and stock in their need for water are forced to seek out the places where conditions are likely to be most favourable for continued tsetse-fly breeding during the dry season.

Detailed knowledge of the complexity of their movements is essential for making contacts with pastoral nomads and for evaluating their epidemiological importance. In a study of the Fulani of western Bornu Province, Northern Nigeria, three types of movement were noted—transhumance, migratory drift and migration (Stenning, 1959). The last two of these are long-term in nature and are of little concern here. The term " transhumance " is used to describe the movements of people with their animals throughout each year and the example which illustrates it (Fig. 3) shows a complex pattern which was followed in a particular year. This pattern would be different in previous and succeeding years and it is in fact unfortunate that the term " transhumance " is used to describe this type of movement. It would be better to restrict its use to describe *regular* seasonal movements between two areas of grazing, along routes which are well defined and which are adhered to each year. Such types of movement are made in lands bordering the Mediterranean Sea and in the Middle East and differ from those made by either the Fulani in West Africa or the Somali in north-east Africa. Where regular routes are followed and where they are controlled by relief features (e.g., movements between plain and mountain) contacts with nomadic peoples may be made much more easily than when the routes of movement may change from year to year. This has been demonstrated in malaria eradication programmes among pastoralists in the Middle East where regular transhumance makes drug administration and residual insecticide spraying possible, though by no means easy.

FIG. 3
SEASONAL MOVEMENTS OF A FULANI GROUP IN WESTERN BORNU, NORTHERN NIGERIA



After Stenning (1959).

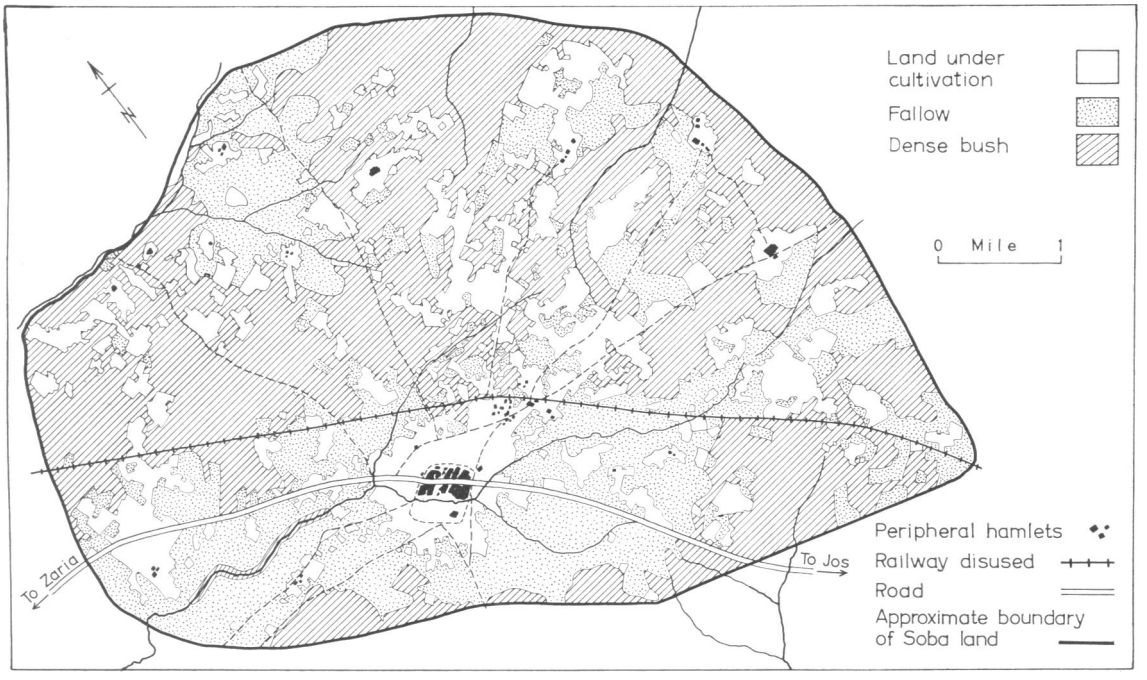
With any pastoral peoples, whether they move along fairly well-defined routes or wander more freely (though not aimlessly), contacts are not easy to establish, for they tend to be conservative in outlook and reserved in their attitude to other people. Their first concern always is for their animals on which they depend, and the way in which nomadic pastoralists in Africa have accepted veterinary services is well known; this should provide trypanosomiasis workers with a useful means of contact.

Movements of cultivators

The movements of cultivators and their relevance to the epidemiology of sleeping-sickness may be considered in two categories.

Seasonal movements. The movement of some people from permanent villages to temporary shelters on farmland during periods of maximum

FIG. 4. LAND USE AND SETTLEMENT AT SOBA, ZARIA PROVINCE, NORTHERN NIGERIA



agricultural activity is common if the farmland is located at long distances from the permanent settlements. Man-fly contacts may thus be increased if the farms are made where there is tsetse-fly breeding.

In some areas a proportion of the population may move out from large towns to surrounding villages during periods of maximum agricultural activity (e.g., from the towns to the cocoa-growing areas in Western Nigeria[1]). These movements may bring people into contact with tsetse flies and sleeping-sickness who would otherwise not be affected.

Long-term movements. These result in changes in the distribution of population and in the pattern of settlements and these facts are related to the points made by Nash which were quoted at the beginning of this paper. At the beginning of the present century with the establishment of more settled conditions in the savannah lands of West Africa people began to move out from the nucleated settlements in which previously they had lived for protection. Each of these settlements had been surrounded by a belt of farmland which extended only so far as would allow the settlement to be regained easily when danger threatened. This land must have been farmed intensively in order to support the population and presumably the degree of clearance of vegetation provided a fly-free zone around each settlement. For various reasons (e.g., to cut fuel) people must have gone at times into the " no-man's land " areas of bush between settlements, but man-fly contacts were either sufficiently " impersonal " to keep transmission at very low levels (owing to the absence of flies in the areas where the population was concentrated) or else flies were not infected (West African Institute for Trypanosomiasis Research, 1951). When people were able to spread out into the " no-man's lands " between settlements they established new hamlets and villages and cleared land for cultivation (Pelissier, 1953). While the dispersal of population led to clearance of bush and to a reduction over-all in the extent of environments favourable to tsetse flies, it also brought people into closer contact with fly-infested areas which existed where clearance was not complete. This would be the case, for example, for the inhabitants of the peripheral hamlets around the village of Soba and comparable villages in the savannah areas of Northern Nigeria (Fig. 4). The work of the Sleeping Sickness Service

[1] It is appreciated that sleeping-sickness is not a problem in these parts of Western Nigeria.

in establishing the Anchau " corridor " in Northern Nigeria showed the need to re-concentrate people in order to get them away from fly-infested areas and to build up a population which was sufficiently dense to maintain a fly-free environment (Nash, 1948).

During the present century there have been other factors responsible for the reduction of environments favourable to the tsetse fly. The population has increased and continues to do so with stable conditions, the provision of medical services and the application of public health measures. To meet the increased demands for food more land has been cleared and is cultivated than in the past. The cultivation of crops for export has developed as a new element in an economy that was formerly one of subsistence with a limited amount of internal exchange, and consequently more land has been brought into cultivation. For example, in the eastern and south-eastern parts of Sokoto Province and in southern Katsina Province on the Niger-Chad watershed, the extent of clearing of the land for the cultivation of cotton and groundnuts has been sufficient to affect the regime of the headwaters of the Rima river system (Ledger, 1961; Prothero, 1962). In contrast, adjacent areas a little further north, on either side of the present-day Sokoto-Katsina provincial boundary, which had formed a virtually uninhabited "no-man's land" between the old kingdoms of Zamfara and Katsina, were made into forest reserves at an early stage of the British Protectorate and so have remained uncultivated. At the present time they are the most northerly areas in Nigeria where the tsetse fly is found.

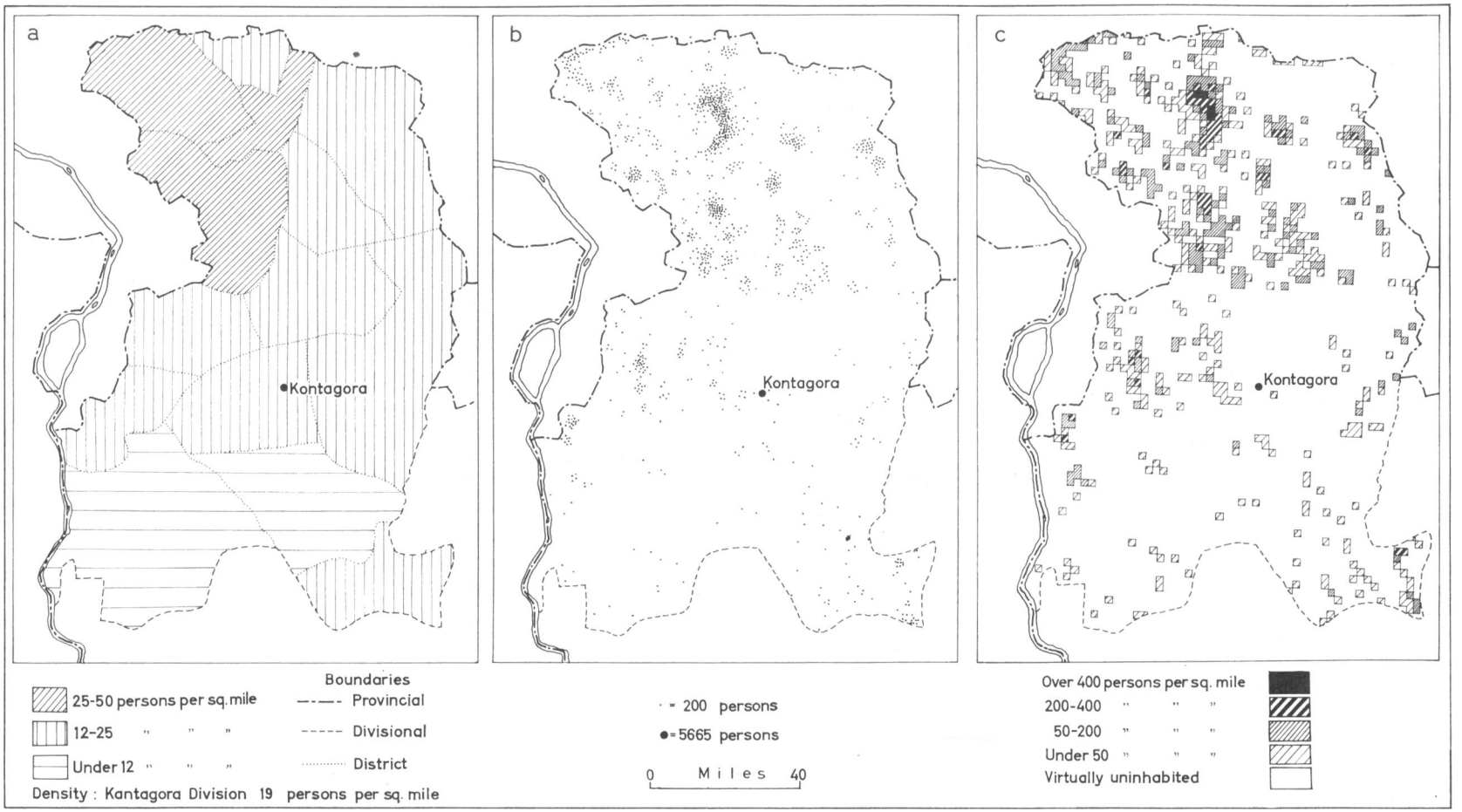
POPULATION DENSITY AND SETTLEMENT PATTERN

These two important elements are closely involved in the epidemiology of sleeping-sickness and in planning and carrying out its eradication (Apted, 1962). For many of the tsetse-fly/sleeping-sickness areas of tropical Africa there is a fair amount of general information concerning population density and settlement pattern but only limited areas have been studied in detail. Generalized data concerning population density, while appearing to be useful, can be most misleading, for they are usually calculated for administrative units of differing size with no account having been taken of the actual distribution of population within these units. On this basis, for example, the " Middle Belt " of Nigeria is usually described as having a low population density and this is true if the densities are calculated for the region as a whole and for the major, and even some of the minor, administrative units into which it is divided (Fig. 5a). More detailed mapping of the distribution of the population in Kontagora Division (Fig. 5b) shows the actual situation, which is that much of the population is in fact concentrated into areas of limited size. In these areas of concentration the density over a few square miles is relatively high and between them there are vast areas which are virtually uninhabited (Fig. 5c). These more detailed data are very different from the generalized density figures. Unfortunately for much of tropical Africa this amount of detail is not available; there are projects in hand which will go some way to remedy deficiencies, but much remains to be done (Prothero, 1961b). The most interesting and undoubtedly the most worth-while mapping of population density for practical needs, such as are being discussed, would be at scales of about 1/50 000 or larger, and nothing has yet been attempted with these.

Population density and settlement pattern are frequently closely related to each other but in tropical Africa there has been only limited study of these relationships. Studies of African farming show that some of the most satisfactory man-land relationships, capable of supporting high population densities without serious losses of soil fertility, are found where the settlement is dispersed, with the majority of the population living in individual compounds or in small hamlets spread over the land that is being farmed. One of the best-known examples of this kind of pattern is in the farmlands around Kano city in Northern Nigeria (Fig. 6) (Grove, 1961). These farmlands support some of the highest rural population densities in tropical Africa and are known to have done so for a very long time; large areas are kept in permanent cultivation and only occasional short fallow periods are necessary to maintain fertility. In areas with a high population density and a dispersed pattern of settlement there is virtually complete clearance of vegetation, which is likely to favour tsetse flies. This is not the case in areas of lower density, where the settlement pattern is nucleated in villages and farming is based on a system by which the land is cultivated for a number of years and then allowed to return to fallow. The fallow period may be of sufficient length to allow the regeneration of vegetation which may be favourable for tsetse-fly breeding. In travelling to and from and working on farmland adjacent to such areas there would appear to be a greatly increased risk of man-fly contacts.

FIG. 5

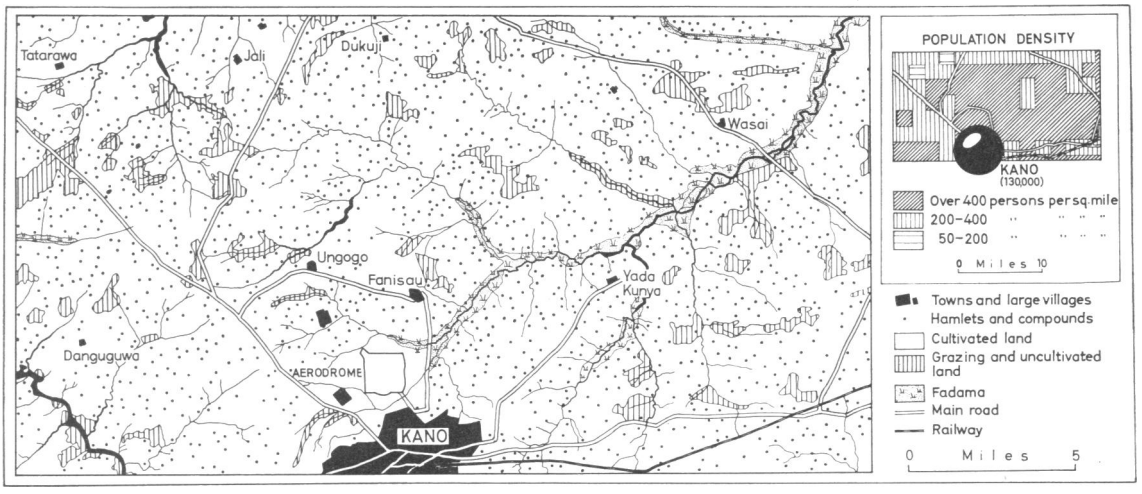
POPULATION DENSITY AND DISTRIBUTION IN KONTAGORA DIVISION, NIGER PROVINCE, NORTHERN NIGERIA



Map " a " shows population density by Districts. Map " b " shows population distribution. Map " c " shows population density as derived from Map " b ".

FIG. 6

SETTLEMENT PATTERN, LAND USE AND POPULATION DENSITY NEAR KANO, NORTHERN NIGERIA



Both population density and settlement pattern are related to population mobility, which has been the main subject of this paper. They are subjects of geographical study which should be considered in relation to many of the medical and public health problems of tropical Africa. They may have as important a bearing on these problems as matters of a strictly medical nature. In most of the work undertaken on trypanosomiasis there has been no lack of appreciation of the importance of these geographical factors and of others, such as climate and vegetation. The way in which they may vary greatly over very short distances has been recognized and the need has been realized to study them as an associated complex and not each in isolation. Nash's assessment of the physical environment and the social and economic conditions at Anchau is an outstanding example of geographical survey and analysis. He appreciated the need to understand all the facts of an existing situation and to plan new developments on the basis of this integrated body of knowledge. The lack of such appreciation has been only too apparent in Africa in the last two decades in medical, public health and other attempted developments.

CONCLUSION

To someone with a knowledge of African population mobility the following questions of its relevance to trypanosomiasis seem important:

1. There was considerable population mobility in Africa prior to the establishment of European colonial government but the movements do not seem to have had much effect on sleeping-sickness. Why was this so ?

2. Work in West Africa (Morris, 1951-52) and more recently in East Africa (Morris, 1961a) has established the spread of sleeping-sickness that took place at the end of the nineteenth century and the beginning of the present century. In Northern Nigeria the spread of infected persons during the present century is reckoned to have been the most potent factor in the widespread epidemics of sleeping-sickness that have occurred (West African Institute for Trypanosomiasis Research, 1951). These are associated with the population mobility that came with more settled conditions under European administration. This mobility has differed in certain respects from that in the past. Have these differences been significant in the spread of sleeping-sickness ?

3. Sleeping-sickness control and the prevention of serious epidemics have been achieved in tropical Africa during the last three decades with the establishment of public health and medical measures. During this period there has been no reduction, but in fact an increase, in population mobility. What are the possibilities for new spreads of sleeping-sickness associated with:

(*a*) new forms of population mobility resulting from political instability in some of the newly independent countries (e.g., movements of refugees in the Congo) ?

(*b*) a reduction (possibly only temporary) in the efficiency of public health and other medical services with the change-over from colonial to independent status ?[1]

[1] This has been discussed in a recent paper (Waddy, 1962).

It is possible that the newly independent African governments will be able to introduce and to enforce measures for controlling some aspects of population mobility, such as might have been considered inexpedient by colonial administrations. What is certainly necessary is greater inter-territorial co-operation in Africa south of the Sahara in studying the significance of population mobility in relation to medical, social and economic problems and developments (Morris, 1961b).

ACKNOWLEDGEMENT

The maps were drawn by Mr A. G. Hodgkiss, Senior Draughtsman, Department of Geography, University of Liverpool.

RÉSUMÉ

Pour expliquer l'augmentation de fréquence des épidémies de maladie du sommeil à la fin du XIX^e^ siècle et au cours des premières décades du XX^e^ par rapport aux siècles passés, l'on a invoqué un mouvement de populations plus actif aujourd'hui qu'autrefois. Mais les déplacements imputables aux migrations tribales, à la transhumance, au commerce, aux pèlerinages ont existé de tout temps sur le continent africain. Lors de l'implantation de l'administration coloniale, les déplacements dus aux guerres tribales et ceux dus à la traite des esclaves cessèrent, mais d'autres formes traditionnelles de migrations subsistèrent. Avec l'expansion économique de nouvelles formes de mouvement ont apparu, dont la plus importante est la migration des travailleurs vers les entreprises agricoles, minières et industrielles. Ces mouvements diffèrent les uns des autres, par certains de leurs aspects, selon que l'on considère l'Afrique occidentale ou l'ensemble Afrique orientale, centrale et méridionale. Il est possible que des faits de cet ordre jouent un rôle dans l'épidémiologie de la trypanosomiase (et par conséquent dans les mesures propres à son traitement et à sa prophylaxie), mais l'on manque de renseignements détaillés à ce sujet.

La stabilité résultant de l'administration européenne a entraîné des changements importants dans la répartition de la population et dans le dessin général de son installation. Ces changements, ainsi que les facteurs qui sont à leur origine ont pu, de façon d'ailleurs variable, peser sur les conditions de milieu favorables à la mouche tsétsé. Si l'on veut appliquer ces données à l'étude de la trypanosomiase, il faut acquérir une meilleure connaissance de la répartition des populations.

Il semble que l'on puisse poser nombre de questions importantes au sujet de la responsabilité des mouvements humains dans l'épidémiologie de la trypanosomiase. Pourquoi les migrations humaines n'ont-elles, autrefois, eu aucune influence sur la maladie du sommeil? Certaines formes toutes récentes de déplacements humains sont-elles vraiment responsables de l'extension d'épidémies de maladie du sommeil? Quelles sont les prévisions à brève échéance à ce sujet? Doit-on s'attendre à de nouveaux mouvements de population (afflux de réfugiés) ou bien faut-il penser que les gouvernements africains indépendants seront plus à même que l'administration coloniale de contrôler les déplacements humains? Il faut intensifier la coopération entre les différents pays africains pour apprécier exactement le rôle des mouvements de population dans les problèmes médicaux sociaux et économiques avec tous leurs corollaires.

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